

### Abstract

A hydrocarbon feedstock containing  $C_5$  olefins,  $C_5$  diolefins, CPD, DCPD, and aromatics is processed by the steps of heating a hydrocarbon feedstock containing CPD, DCPD,  $C_5$  diolefins, benzene, toluene, and xylene in a heating zone, to dimerize CPD to DCPD, thereby forming a first effluent; separating the first effluent into a  $C_6 +$  stream and a  $C_5$  diolefin stream; separating the  $C_6 +$  stream into a  $C_6 - C_9$  stream and a  $C_{10} +$  stream; separating the  $C_{10} +$  stream into a fuel oil stream and a DCPD stream; and hydrotreating the  $C_6 - C_9$  stream to thereby form a BTX stream.

In an alternate embodiment, the hydrocarbon feedstock is processed by the steps of heating the hydrocarbon feedstock in a heating zone, to dimerize CPD to DCPD, thereby forming a first effluent; separating the first effluent into a  $C_5 - C_9$  stream and a  $C_{10} +$  stream; separating the  $C_{10} +$  stream into a fuel oil stream and a DCPD stream; contacting the  $C_5 - C_9$  stream with a selective hydrogenation catalyst, in a first reaction zone and in the presence of hydrogen, to hydrogenate at least a portion of the diolefins, alkynes, and styrene contained in the  $C_5 - C_9$  stream, thereby forming a second effluent; separating the second effluent into a  $C_6 - C_9$  stream and a  $C_5$  olefin stream; and contacting the  $C_6 - C_9$  stream with a hydrodesulfurization catalyst, in a second reaction zone and in the presence of hydrogen, to desulfurize at least a portion

20 of the sulfur-containing compounds contained in the C<sub>6</sub> - C<sub>9</sub> stream thereby forming a BTX stream.